

CLAIMS

What is claimed is:

1. A coupling device, comprising:

a nozzle including a nozzle collar and handle assembly fixed together, and a valve body and fitting fixed together, the nozzle collar and handle assembly outwardly surrounding and rotatably supported with respect to the valve body and fitting, the valve body including an internal valve, and the collar having helical channels with entrance openings at a downstream end of the collar and opening outwardly along an exterior surface thereof; and

a receptacle mateable with the nozzle, the receptacle also including a valve body including an internal valve, and a collar radially outwardly disposed from the valve body and defining therewith an annular cavity to receive the collar of the nozzle; the valve body of the nozzle being received in the valve body of the receptacle, the collar of the receptacle including a series of radial locking devices spaced along an interior surface of the collar and received in the helical channels of the nozzle to secure the nozzle to the receptacle when the nozzle is rotated in one direction with respect to the receptacle during connect, and wherein the channels have a geometry along their length which causes the radial locking devices to be retained along the channels in a vent position when the nozzle is rotated in an opposite direction with respect to the receptacle during disconnect.

2. The coupling device as in claim 1, wherein a pair of bushings rotatably support the nozzle collar and handle assembly with respect to the valve body and fitting, one of said bushings being disposed between the handle assembly and fitting, and the other of the bushings being disposed between the nozzle collar and the nozzle valve body.

1 3. The coupling device as in claim 2, wherein the handle assembly and nozzle collar
2 are axially retained on the valve body and fitting by a retaining ring at one end of the
3 handle assembly, and by cooperation between a shoulder of the nozzle valve body and a
4 shoulder of the nozzle collar.

1 4. The coupling device as in claim 1, further including openings in the handle
2 assembly of the nozzle to allow air circulation around an extent of the fitting.

1 5. The coupling device as in claim 1, further including a pair of interface sealing
2 elements carried by the nozzle valve body and located between the nozzle valve body and
3 the receptacle valve body to prevent fluid leakage therebetween.

1 6. The coupling device as in claim 5, wherein the seals are located between a
2 shoulder on the nozzle valve body and a retaining ring, the retaining ring being
3 removable to allow maintenance and servicing of the seals.

1 7. The coupling device as in claim 1, wherein the radial locking devices comprise
2 roller bearings, removeably attached to the receptacle collar.

1 8. The coupling device as in claim 1, wherein the nozzle and receptacle are only
2 mateable if they have properly configured and cooperation radial locking devices and
3 helical channels, to prevent the mating of an improper nozzle and receptacle.

1 9. A nozzle for the receptacle of a coupling device, the nozzle comprising a nozzle
2 collar and handle assembly fixed together, and a valve body and fitting fixed together, the
3 nozzle collar and handle assembly outwardly surrounding and rotatable with respect to a
4 valve body and fitting, and the valve body including an internal valve; the collar having
5 helical channels with entrance openings at an axial downstream end of the collar and
6 opening outwardly along an exterior surface thereof for receipt of bearings from the

7 receptacle; wherein the channels have a geometry along their length which causes the
8 bearings to be retained along the channels in a vent position when the nozzle is rotated
9 with respect to the receptacle during disconnect.

1 10. The nozzle as in claim 9, wherein a pair of bushings support the nozzle collar and
2 handle assembly with respect to the valve body and fitting, one of said bushings being
3 disposed between the handle assembly and fitting, and the other of the bushings being
4 disposed between the nozzle collar and the nozzle valve body.

1 11. The nozzle as in claim 10, wherein the handle assembly and nozzle collar are
2 axially retained on the valve body and fitting by a retaining ring at one end of the handle
3 assembly, and by cooperation between a shoulder of the nozzle valve body and a
4 shoulder of the nozzle collar.

1 12. The nozzle as in claim 9, further including openings in the handle assembly of the
2 nozzle to allow air circulation around an extent of the fitting.

1 13. The nozzle as in claim 9, further including a pair of interface sealing elements
2 carried by the nozzle valve body.

1 14. The nozzle as in claim 13, wherein the seals are located between a shoulder on the
2 nozzle valve body and a retaining ring, the retaining ring being removable to allow
3 maintenance and servicing of the seals.

1 15. A receptacle for the nozzle of a coupling device, the receptacle including a valve
2 body including an internal valve, and a collar radially outwardly disposed from the valve
3 body and defining therewith an annular cavity to receive a collar of the nozzle; the collar
4 of the receptacle including a series of bearings spaced along an interior surface of the

5 collar which can be received in helical channels of the nozzle to secure the nozzle to the
6 receptacle when the receptacle is rotated in one direction with respect to the nozzle.

1 16. The receptacle as in claim 15, wherein the bearings project radially inward from
2 the receptacle collar.

1 17. The receptacle as in claim 16, wherein the bearings are removeably attached to
2 the receptacle collar.